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How obstacles and facilitators predict academic performance: the mediating role of study burnout and engagement

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Most people would agree with the maxim that "success breeds success." However, this is not the whole story. The current study investigated the additional impact of psychosocial factors (i.e., performance obstacles and facilitators) as well as psychological well-being (i.e., burnout and engagement) on success (i.e., academic performance). More specifically, our purpose was to show that, instead of directly affecting future performance, obstacles and facilitators exert an *in*direct effect via well-being. A total of 527 university students comprised the sample and filled out a questionnaire. We obtained their previous and future academic performance Grade Point Average (GPA) from the university's records. Structural equations modeling showed that the best predictor of future performance was the students' previous performance. As expected, study engagement mediated the relationship between performance obstacles and facilitators on the one hand, and future performance on the other. Contrary to expectations, burnout did *not* predict future performance, although, it is significantly associated with the presence of obstacles and the absence of facilitators. Our results illustrate that, although "success breeds success" (i.e., the best predictor of future performance is past performance), positive psychological states like study engagement are also important in explaining future performance, at least more so than negative states like study burnout.

Keywords: student well-being; burnout; engagement; obstacles; facilitators; performance

University and college experiences indeed result in distress for some students because they are involved in structured coercive activities (e.g., attending classes and doing assignments), which aim toward a specific goal (i.e., passing exams and acquiring a degree). This may take either the more general form of anxiety of depression (Abouserie, 1994; Chambel & Curral, 2005; Cotton, Dollard, & De Jonge, 2002; Felsten & Wilcox, 1992), or the more specific form of study burnout (Balogun, Helemoe, Pellegrini, & Hoeberlein, 1995; Gold, Bachelor, & Michael, 1989; Jemmott & Magliore, 1988; McCarthy, Pretty, & Catano, 1990; Powers & Gose, 1986; Schaufeli & Salanova, 2007; Schaufeli, Salanova, González-Romá, & Bakker, 2002; Yang, 2004). Initially, former works linked the burnout concept to human services, such as health care, education, and social work, where employees do "people" work of some kind (Maslach & Jackson, 1981). Later, it extended to include other occupational groups outside human services (Schaufeli, Leiter, Maslach, & Jackson,

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1996). For more than two decades, however, burnout among students has also been the objective of empirical studies (Gold & Michael, 1985; Meier & Schmeck, 1985; Nowack, Gibbons, & Hanson, 1985), where it manifests itself as feeling exhausted because of study demands, having a cynical and detached attitude toward one's study, and feeling incompetent as a student.

Although the results are not entirely conclusive, there is some evidence for a weak negative relationship between burnout and performance (Bhagat, Allie, & Ford, 1995; Garman, Corrigan, & Morris, 2002; Parker & Kulik, 1995; Sing, 2000; Wright & Cropanzano, 2000). More specifically, a recent meta-analysis of 16 studies revealed that emotional exhaustion particularly relates negatively to work performance (Taris, 2006). In a similar vein, some research found a negative relationship between burnout and academic achievement among students (McCarthy et al., 1990) Hence, it is plausible that burned-out students will perform poorly because they feel exhausted, used up, irritable, frustrated, detached, and cynical.

Of course, students also experience positive feelings and attitudes toward their studies; they may feel engaged and motivated because they are successful and have accomplished important goals. Another topic investigated in the study context, which takes its behavioral or psychological perspective into account, is engagement (Horstmanshof & Zimitat, 2007). From the behavioral perspective, some research viewed study engagement as an outcome with a combination of intentions and successful academic and social integration within the study environment (Tinto, 1993). For example, McInnis (2001) saw engagement as a combination of intellectual application, diligence, and participation in the learning community, underpinned by a sense of purpose. From a psychological level, there have been reports that engagement may be a measure of student involvement with university studies and that it represents "the amount of physical and psychological energy that the student devotes to the academic experience" (Astin, 1984). The present study conceptualized study engagement as a persistent, positive affective-motivational state of fulfillment that includes three aspects: vigor, dedication, and absorption (Salanova, Bresó, & Schaufeli, 2005b; Schaufeli & Salanova, 2007; Schaufeli et al., 2002). Conceptually speaking, vigor and dedication relate negatively with the core burnout dimensions, exhaustion and cynicism, respectively. Whereas, burned-out students lack energy and distance themselves by displaying a cynical attitude toward their studies, engaged students feel energetic and identify strongly with their studies as they are deeply involved in them.

In a seminal investigation of student-engaged academic behavior in secondary school classrooms, Frederick (1977) found that high-achieving students were engaged academically for 75% of the time, compared to 51% for low-achieving students. The longer students remain disengaged from tasks, the more likely their academic performances will suffer, resulting in undesirable outcomes. So far, there is evidence for a positive relationship between engagement and performance at work (Demerouti & Bakker, 2006; Harter, Schmidt, & Hayes, 2002; Salanova, Agut, & Peiró, 2005a; Schaufeli, Taris, & Van Rhenen, 2008), as well as in learning and academic settings. For example, an experimental study with students performing a group task found a positive relationship between engagement and performance: the more engaged the student groups felt, the better they performed (Salanova, Llorens, Cifre, Martínez, & Schaufeli, 2003). With Australian college students, Cotton et al. (2002) also found that satisfied students with low levels of anxiety and depression

performed better, not only because they achieved better results, but also because they were more involved and engaged with the school and actively contributed to its effectiveness. In a similar vein, Chambel and Curral (2005) showed that levels of positive well-being (i.e., satisfaction) among Portuguese students had a direct positive impact on their performance.

The present investigation extends the predictions of the Job Demands-Resources (JD-R) model (for further information about the model, see Bakker & Demerouti, 2007; Schaufeli & Bakker, 2004). The JD-R model assumes two processes in which burnout and engagement play a key role: (1) an effort-driven energetic process that starts with demands, leading to negative outcomes (e.g., poor performance) through burnout; and (2) a motivational process driven by the availability of resources, leading to positive outcomes (e.g., high performance) through engagement. A number of studies have confirmed this mediating role of burnout and engagement between demands/resources and various negative/positive outcomes (Hakanen, Bakker, & Schaufeli, 2006, Hakanen, Schaufeli, & Ahola, 2008; Korunka, Kubicek, Schaufeli, & Hoonakker, in press; Llorens, Bakker, Schaufeli, & Salanova, 2006).

In the present study, we used performance obstacles and performance facilitators instead of demands and resources. The definition of obstacles is the characteristics of the situation that have the capacity to impede job performance and restrict productivity (Brown & Mitchell, 1991, 1993; Carayon, Gurses, Hundt, Ayoub, & Alvarado, 2005; Peters & O'Connor, 1980). In other words, obstacles are tangible organizational characteristics that may potentially restrict performance. Following Carayon et al. (2005), we not only included performance *obstacles* that refer to *negative* factors that *hinder* performance, but also *positive* factors that *enhance* performance. The term used for the latter is facilitators, defined as those aspects of the situation that may promote performance or one's ability to optimally perform one's job (or study). Thus the current study included negative (i.e., performance obstacles) and positive (i.e., performance facilitators) factors in a way that is analogous to the negative and positive factors included in job stress research (e.g., Karasek & Theorell, 1990; Schaufeli & Bakker, 2004; Siegrist, 1996). Obstacles and facilitators are similar to demands and resources, except that they are more specific and, *by definition*, relate to performance. While we may use demands and resources in different settings, obstacles and facilitators are specific for each situation, for example, "*The computer is down*," or "*Study information (easy access)*" (Brown & Mitchell, 1993; Carayon et al., 2005; Peters & O'Connor, 1980). We extended previous research by not only including situational (i.e., organizational and social) but also *personal* obstacles and facilitators, that refer to those individual or personal factors that may hinder or boost performance, respectively. Poor planning is an example of a personal obstacle, whereas personal facilitators are, for instance, flexibility and success expectations. We expect that both situational *and* personal obstacles and facilitators relate with students' well-being and performance.

There is some evidence that organizational obstacles negatively affect psychological well-being, and that organizational facilitators play the opposite role; that is, they seem to improve psychological well-being (Brown & Mitchell, 1993; Schneider & Bowen, 1993). For example, in a meta-analytic study about obstacles and outcomes (i.e., performance, satisfaction and frustration), Villanova and Roman (2002) found that obstacles showed a weak negative relationship with performance and a fairly robust negative relationship with satisfaction and frustration. However,

we did *not* investigate indirect relationships between obstacles and performance via affect in this study. In the present study, we assumed that, instead of directly influencing performance, obstacles and facilitators have an *in*direct effect, namely through student well-being (i.e., burnout and engagement) (see Figure 1).

Evidence for such an indirect effect derives from the study of Cotton et al. (2002) that found that high study demands in combination with low control plus poor social support decreased students' well-being, and subsequently resulted in poor academic performance. In addition, and in accordance with the authors' *happy-productive student hypothesis*, satisfaction mediated the impact of environmental factors on performance. Chambel and Curral (2005) showed that student's well-being also mediated the relationship between control and performance, but this mediating relationship was *not* found for distress indicators of well-being (i.e., anxiety and depression).

Based on our conceptual model (see Figure 1), we formulated the following four hypotheses:

1. H1: Previous performance would predict future performance ("Success breeds success").
2. H2: The better the previous performance, the fewer obstacles and the more facilitators would be perceived.
3. H3: Burnout would serve as a mediator of the relationship between obstacles/ facilitators and future academic performance.
4. H4: Engagement would serve as a mediator of the relationship between obstacles/facilitators and future academic performance.

In addition, and in order to examine the full versus the partial mediation of obstacles/facilitators and of burnout/engagement, respectively, we will test an alternative model that includes direct paths from previous performance to burnout and engagement as well as direct paths from obstacles and facilitators to future performance.
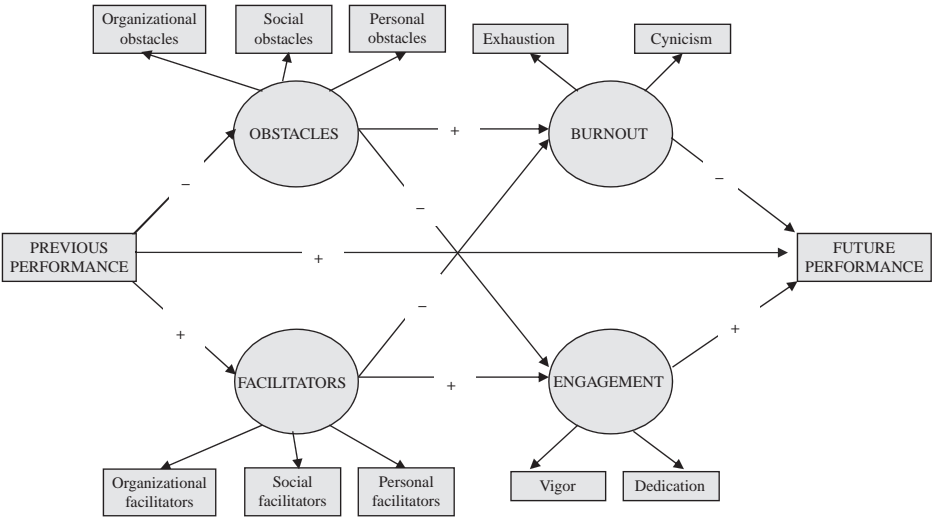

Figure 1.   The hypothesized model.

Method

Sample and procedure

We formed a stratified sample of 867 students from around the 6000 undergraduate students of a Spanish University based on the number of students of each of its three faculties. The final study sample comprised 527 students; 67% were female and 33% were male. Participants majored in social and behavioral sciences (40%), chemistry and engineering (33%), and law (27%). All the study programs take four years to complete, including one-year follow-up GPA's, so only the students from the first (33.2%), second (42.9%) and third years (23.9%) participated in the research. The mean age of the sample was 22 years and six months (SD =2.6; ranging from 18 to 43 years). PhD students handed out questionnaires before a class started, and participation was voluntary. Originally, 863 students completed the questionnaire, but 236 students did not indicate their identification numbers, so it was not possible to obtain their GPA scores. We did not include these students in the analyses presented here.

Measures

In order to measure *performance obstacles and facilitators*, we developed a self-constructed inventory. For that purpose, we conducted an independent preliminary qualitative study to identify specific performance obstacles and facilitators for students. In this qualitative study, we used an adaptation of the critical incident approach (Flanagan 1954). We held a brainstorming session with a group of 40 university students in which the participants were invited to recall past situations when their academic performance was below par, and then to recall conditions and factors that were present at that time. Next, the participants answered similar questions about performance facilitators. By remembering these past situations, where their academic performance was below par, the students had to recall the conditions or factors that helped them to either overcome obstacles or increase their performance. In the brainstorming session, the participants discussed the main obstacles and facilitators of their performance, first individually and then in small groups. Finally, all the members of the entire group reached a consensus. As a result of the critical incident group procedure, 35 obstacles and 31 facilitators remained. Subsequently, after the removal of redundant items, the researchers distinguished between organizational or academic, social or interpersonal, and personal obstacles and facilitators. They identified 24 obstacles (i.e., 15 organizational, five social and four personal obstacles) and 30 facilitators (i.e., 17 organizational, seven social and six personal facilitators) (see Tables 1 and 2 for a list of the all performance obstacles and facilitators).

Finally, we made an inventory of these two sets of obstacles and facilitators, whereby we used a dichotomous scoring system: zero (not present) to one (present). We took the sum of the number of obstacles and facilitators as a quantitative measure of the amount of academic obstacles and facilitators for all three categories (i.e., organizational, social, and personal).

Study burnout

We used the MBI-SS (Student Survey) (Schaufeli et al., 2002) to assess exhaustion and cynicism, whereby we excluded the third dimension of burnout, incompetence or

Table 1. Frequency, percentage (%) and category (i.e., organizational, social or personal) of performance obstacles in the study ($n = 527$).

Order	Obstacles	Frequency	%	Category
1	Agglomeration and insufficient photocopying service	380	72	ORGANIZ.
2	Overload (e.g., too many tasks to do everything well)	277	52.6	ORGANIZ.
3	Anticipatory anxiety for the exams	263	50	PERSONAL
4	Mismatch between time-number of credits for courses (e.g., too many credits per semester)	241	45.7	ORGANIZ.
5	Agglomeration and insufficient food services	238	45.2	ORGANIZ.
6	Inadequate temperature in common spaces	235	44.6	ORGANIZ.
7	Problems with schedules (e.g., overlaps class.)	231	43.8	ORGANIZ.
8	Inappropriate transport to the University	223	42	ORGANIZ.
9	Personal lack of planning and organization time	218	41.4	PERSONAL
10	Non ergonomic desks and blackboards.	174	33	ORGANIZ.
11	Inadequate preparation for career opportunities	140	26.6	ORGANIZ.
12	Library with few books	126	24	ORGANIZ.
13	Insufficient or inappropriate spaces	124	23.5	ORGANIZ.
14	Lack of personal training and background needed for studying	119	22.6	PERSONAL
15	Lack of information about what tasks I have to do, meeting deadlines, etc.	106	20.8	ORGANIZ.
16	Lack of financial resources	96	18.2	PERSONAL
17	Performing tasks that require too much concentration, attention and memory	87	16.5	ORGANIZ.
18	Limited information and insufficient student assistance service	78	14.8	ORGANIZ.
19	Teachers are late for teaching and/or tutoring	66	12.5	SOCIAL
20	Teachers are absent for teaching and/or tutoring	64	12	SOCIAL
21	Dealing with difficult issues with classmates, teachers ... (e.g., exam review, teamwork)	57	10.8	SOCIAL
22	Performing routine and repetitive tasks	37	7	ORGANIZ.
23	Excessive competitiveness among peers	36	6.8	SOCIAL
24	Too many teachers per course	26	5	SOCIAL

lack of efficacy, because accumulating evidence suggests that this dimension plays a different role in the burnout process (Brenninkmeijer & Van Yperen, 2003; Bresó, Salanova, & Schaufeli, 2007; Green, Walkey, & Taylor, 1991; Lee & Ashforth, 1996; Schaufeli & Salanova, 2007). Hence, recent works argue that exhaustion and cynicism constitute the core of burnout (Schaufeli & Taris, 2005). The exhaustion (EX) scale includes six items (e.g., "*I feel emotionally drained by my studies*") and the cynicism (CY) scale includes four items (e.g., "*I doubt the significance of my studies*"). All the items scored on a seven-point frequency rating scale ranging from zero ("never") to six ("always"). The internal consistencies (Cronbach's α) for EX and CY were .74 and .77, respectively.

Table 2.   Frequency, percentage (%) and category (i.e., organizational, social or personal) of performance facilitators in the study ($n = 527$).

Order	Facilitators	Frequency	%	Category
1	Library opened with a photocopy machine at nights during the exam period	264	50.1	ORGANIZ.
2	Photocopying service (e.g., access for notes and other materials)	235	45	ORGANIZ.
3	Tolerance and group cohesion among colleagues	224	42.5	SOCIAL
4	Social support from family and friends	216	41	SOCIAL
5	Access to students' grants	169	32.1	ORGANIZ.
6	Tutoring time available	158	30	SOCIAL
7	Living in the city where I am studying	152	28.8	PERSONAL
8	Access to computer labs (e.g., Internet, e-mail).	149	28.3	ORGANIZ.
9	Information about the study program prior to enrollment	142	26.9	ORGANIZ.
10	Information Services for students	138	26	ORGANIZ.
11	Personality characteristics (e.g., responsibility, optimism, extraversion, mental flexibility)	138	26.2	PERSONAL
12	Good social relationships with teachers	135	25.6	SOCIAL
13	Sunny and properly lighted and ventilated classrooms	130	24.7	ORGANIZ.
14	Practical with few students	123	23.3	ORGANIZ.
15	Personal positive expectations in labor market	122	23.1	PERSONAL
16	Personal expectations for success in studies	112	21.3	PERSONAL
17	Transport to/from the university (e.g., frequent buses)	103	19.5	ORGANIZ.
18	Having economic resources (e.g., money, computer, car).	103	19.5	PERSONAL
19	Timetable flexibility for doing practical classes	99	18.8	ORGANIZ.
20	Feedback from teachers or colleagues	91	17	SOCIAL
21	Existence of the figure of student delegate	88	16.7	SOCIAL
22	Having autonomy to determine what tasks I will perform everyday	77	14.6	ORGANIZ.
23	Previous knowledge, skills and training before enrollment	69	13.1	PERSONAL
24	Granted cultural activities (e.g., theatre, sports).	67	12.7	ORGANIZ.
25	Good relationships with staff and services employees	54	10	SOCIAL
26	Administrative services being located in the same building	53	10	ORGANIZ.
27	Access to student language learning service	45	8.5	ORGANIZ.
28	Getting immediate feedback from the task about my performance	27	5.1	ORGANIZ.
29	Access to University-Enterprise Foundation service	25	4.7	ORGANIZ.
30	Student association	22	4	ORGANIZ.

Study engagement (i.e., vigor and dedication)

We assessed this with the UWES-SS (Student Survey) (Schaufeli et al., 2002), whereby we excluded the third dimension of engagement, absorption because evidence suggests that this dimension plays a different role in the engagement

construct (Mauno, Kinnunen, & Ruokolainen, 2007; Salanova et al., 2003). Hence, recent works argue that vigor and dedication constitute the core of engagement (Schaufeli & Salanova, 2007). The vigor (VI) scale includes six items (e.g., "*When I'm doing my work as a student, I feel bursting with energy*") and the dedication (DE) scale includes five items (e.g., "*I am enthusiastic about my studies*"). The UWES-SS items scored similarly to those of the burnout inventory. The internal consistencies (Cronbach's α) for VI and DE were .75 and .84, respectively. In order to avoid answering bias, we merged the burnout and engagement items randomly.

Academic performance

We measured this by the students' GPA of the previous semester (i.e., previous performance) and of the following semester (i.e., future performance). We obtained students' GPA from the university records. In the Spanish grading system, GPA ranges from five (low) to 10 (high).

Data analyses

We performed a preliminary Confirmative Factor Analysis (CFA) of two latent factors, i.e., performance obstacles and facilitators, with three indicators each, i.e., organizational, social, and personal obstacles and facilitators. In addition, we used structural equation modeling (SEM) methods, as implemented by Analysis of MOment Structures (AMOS) (Arbuckle, 1997), to test the research model (see Figure 1), as well as an alternative mediation model with additional direct paths from previous performance to burnout and engagement, and from obstacles and facilitators to future performance. We also used maximum likelihood estimation methods, and the input for each analysis was the covariance matrix of the items. We used absolute and relative indices to assess the goodness-of-fit of the models. The *absolute* goodness-of-fit indices (GFIs) calculated were: (1) the χ^2 goodness-of-fit statistic; (2) the root mean square error of approximation (RMSEA); (3) the GFI; and (4) the adjusted goodness-of-fit index (AGFI) (Jöreskog & Sörbom, 1993). Since the χ^2-test is sensitive to sample size, the computation of relative GFIs is strongly recommended (Bentler, 1990). We computed the following *relative* GFIs: (1) normed fit index (NFI); (2) non-normed fit index (NNFI) – also called the Tucker Lewis index (TLI); and (3) comparative fit index (CFI) (Marsh, Balla, & Hau, 1996). Since the distribution of the GFI and the AGFI is unknown, no statistical test or critical value is available (Jöreskog & Sörbom, 1993). For RMSEA, and as a rule of thumb, values smaller than .08 indicate an acceptable model fit (Cudeck & Browne, 1993), whereas *f* values greater than .90 or all three relative fit indices indicate a good fit (Hoyle, 1995). Finally, we computed the Akaike Information Criterion (AIC; Akaike, 1987) to compare competing models because it is particularly well suited for comparing the adequacy of the non-nested models that fit the same correlation matrix. The lower the AIC index, the better the fit is.

Results

Descriptive analyses

Tables 1 and 2 show a list of performance obstacles (Table 1) and facilitators (Table 2) that resulted from the qualitative data analyses. The main obstacles are organizational in nature, such as, "*Agglomeration and insufficient reprography service*," "*Overload: too many tasks to do well*," and personal "*Anticipatory anxiety for the exams.*" The main facilitators are also organizational in nature, such as, "*Library opened with photocopy machine at night during the exam periods*," "*Photocopying service*," but there is also mention of social facilitators, such as "*Tolerance and group cohesion among colleagues*" and "*Social support from family and friends.*"

Table 3 shows the means, standard deviations, intercorrelations, and internal consistencies (Cronbach's α) of the study variables. As Table 3 shows, all the α values meet the criterion of .70 (Nunnaly & Bernstein, 1994). Other than personal obstacles and personal facilitators, all the other obstacles and facilitators relate *positively*, meaning that the more obstacles students perceive, the more facilitators they identify, and vice versa.

Preliminary confirmatory factor analysis

We tested two competitive models to examine whether performance obstacles and facilitators constitute one common latent factor or two correlated latent factors (i.e., performance obstacles and performance facilitators). The one-factor model did not fit the data well ($\chi^2_{(9)} = 60.809$; $p < .00$; GFI = .96; AGFI = .90; RMSEA = .11; NFI = .82; CFI = .87; AIC = 84.80). In contrast, the two-factor model showed a good fit ($\chi^2_{(8)} = 14.159$; $p < .08$; GFI = .99; AGFI = .97; RMSEA = .03; NFI = .97; CFI = .98; AIC = 40.159). This model postulates two underlying positively correlated constructs: performance obstacles and facilitators with three indicators each: organizational, social, and personal obstacles on one hand, and organizational, social, and personal facilitators on the other hand. This model confirms the qualitative analyses that resulted in the three categories of obstacles and facilitators.

Model testing

First, we tested the fit of the research model to the data, as shown in Figure 1. The research model fits the data well as all the fit indices meet their respective criteria (see Table 4), and all path coefficients are significant, except the paths from previous performance to performance obstacles ($\beta = -.02$, n.s.) and from burnout to future performance ($\beta = .05$, n.s.) (see Figure 2). These results confirmed Hypothesis 1, that is, success leads to success: previous performance positively predicted future academic performance ($\beta = .72$, $p < .001$). The results confirm Hypothesis 2 for facilitators, but not for obstacles: the better the previous performance, the more facilitators perceived, but previous performance did not relate to perceiving fewer obstacles. Regarding Hypotheses 3 and 4, the results were as expected, that is, engagement mediates the relationship between obstacles and facilitators on one hand

Table 3. Means (M), Standard Deviations (SD), Correlations (r) and internal consistencies (Cronbach's a) of the study variables ($n = 527$).

	M	SD	α	2	3	4	5	6	7	8	9	10	11	12
1. Prev. performance	6.58	0.75	–	.03	.01	−.11*	.06	.03	.12**	−.07	−.08	.13**	.10*	.74***
2. Organiz. obstacles	5.11	2.36	–		.35***	.34***	.29***	.25***	.29***	.10*	.06	−.01	.02	.08
3. Social obstacles	0.47	0.76	–			.19***	.24***	.17***	.23***	.03	.10*	.06	−.01	.09
4. Personal obstacles	1.50	1.13	–				.17***	.18***	.07	.21***	.25***	−.12**	−.13**	−.13**
5. Organiz. facilitators	3.27	2.15	–					.40***	.36****	−.01	−.10*	.10*	.12**	.04
6. Social facilitators	2.10	1.57	–						.34***	−.05	−.10*	.13**	.20***	.06
7. Personal facilitators	1.70	1.52	–							−.05	−.16***	.16***	.17***	.12**
8. Exhaustion	2.76	1.09	.74								.44***	−.18***	−.25***	−.08*
9. Cynicism	1.73	1.24	.77									−.30***	−.58***	−.07
10. Vigor	2.94	0.95	.75										.60***	.17***
11. Dedication	4.22	1.11	.84											.14**
12. Fut. performance	6.60	0.66	–											–

Table 4. The fit of the hypothesized research model (M1) and the alternative model (M2) ($n = 527$).

	χ^2	df	p	GFI	AGFI	RMSE-A	NFI	IFI	CFI	AIC	$\Delta\chi^2$	df
Research model	115.470	46	.00	.96	.94	.05	.93	.93	.95	179.47		
Altern. model	111.215	42	.00	.96	.93	.06	.93	.92	.95	183.21	M1 − M2 = 4.25ns	4

Note: χ^2 = Chi-square; df = degrees of freedom; GFI = Goodness-of-Fit Index; AGFI = Adjusted Goodness-of-Fit Index; RMSEA = Root Mean Square Error of Approximation; NFI = Normed Fit Index; IFI = Incremental Fit Index and CFI = Comparative Fit Index. AIC = Akaike Information Criterion; $\Delta\chi^2$ = Delta Chi-square; M1 = research model. M2 = alternative model; ns = non-significant differences.
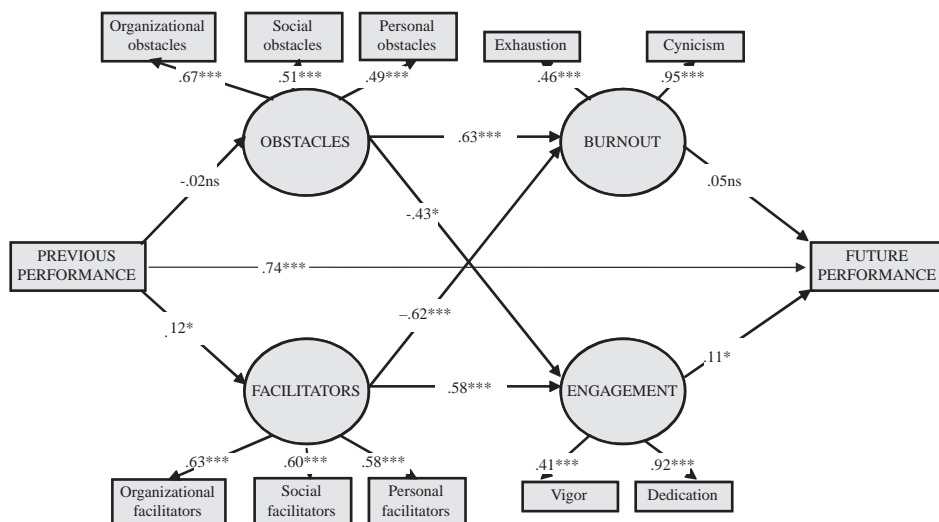
Figure 2.   The final model (standardized path coefficients).
Note: ns = non significant.
*p < .05; ***p < .001.

and future performance on the other hand, whereas unexpectedly, burnout does not. Hence, these results confirm Hypothesis 4 in relation to the mediating role of engagement, but not Hypothesis 3 in relation to the mediating role of burnout (i.e., the more obstacles perceived the more burnout, but burnout, in turn, does not predict future academic performance).

In order to test whether the mediation of the impact of obstacles and facilitators on future performance by student's well-being is full or partial, we subsequently fitted an alternative model to the data. As Table 4 shows, this alternative model also fits the data well, although its fit provides no improvement when compared to the original model ($\Delta\chi^2_{(4)} = 4.25$, n.s.). In the alternative model, however, the direct paths from past performance to burnout ($\beta = -.02$, n.s.), from past performance to engagement ($\beta = .06$, n.s.), from obstacles to future performance ($\beta = .11$, n.s.) and from facilitators to future performance ($\beta = -.06$, n.s.) were all non-significant. Moreover, the AIC of the research model was lower than that of the alternative model. Together, the results indicate a full mediation of the impact of obstacles and facilitators on future performance by student's well-being, and especially by engagement.

Finally, we calculated Sobel tests to assess whether or not a mediator variable significantly carries the influence of an independent variable to a dependent variable; i.e., whether the indirect effect of the independent variable on the dependent variable through the mediator variable is significant. The results show that the indirect effect of obstacles on future performance through engagement comes close to significant ($t = 1.87$, $p = .06$), whereas the indirect effects of facilitators on future performance through engagement and of past performance to engagement through facilitators are significant ($t = 1.99$, $p = .04$ and $t = 2.08$, $p = .03$, respectively).

Figure 2 shows the standardized path coefficients of the research model, which account for 56% of the variance of student's future academic performance. Figure 2 shows, as expected, that the paths from obstacles to engagement and from

facilitators to burnout are both negative, meaning that the more obstacles students perceive, the less engaged they are, and the more facilitators they perceive, the less burned-out they feel. Obstacles and facilitators positively correlate (see Table 1), whereas burnout and engagement relate negatively.

Discussion

The present study investigated the mediating role played by students' well-being (i.e., burnout and engagement) in the relationship between perceived performance obstacles and facilitators, and future academic performance. We found that engagement, and not burnout, fully mediated the impact of performance obstacles and facilitators on future academic performance, that is, facilitators associate positively and obstacles associate negatively with engagement. Both obstacles and facilitators, in turn, positively affect future academic performance. In addition to the indirect effects of obstacles and facilitators through student well-being (i.e., engagement), past performance strongly predicted future academic performance. It is not surprising that success breeds success, but our study underscores the additional importance of obstacles, facilitators and student's well-being in predicting future academic success.

As expected, obstacles associated positively and facilitators associated negatively with burnout, but we observed *no* significant effect of burnout on future academic performance. The latter agrees with past research, which either failed to find a link between burnout and performance or found a very weak relationship, particularly when measuring performance by using objective indicators (Demerouti & Bakker, 2006; Taris, 2006). In short, those students who perceive many facilitators and few obstacles in their environment feel engaged, which may boost their future academic performance. However, those students who perceive many obstacles and few facilitators feel burned-out, but that does not seem to affect their future academic performance.

In addition, we found a positive association between obstacles and facilitators. At first glance this might seem rather puzzling because one would expect obstacles and facilitators to be negatively related given the fact that facilitators mitigate problems caused by obstacles that interfere with performance (Tesluk & Mathieu, 1999). However, one may speculate that those students who perceive many obstacles look actively for facilitators as a way of coping by way of compensation (Eriksen, Olff, & Ursin, 2000). Interestingly, not all the performance obstacles and facilitators seem to work similarly. For example, personal obstacles and facilitators do not correlate positively, unlike organizational and social obstacles and facilitators which do. This finding supports a speculative explanation that it is easier, by way of coping, to identify performance facilitators in the social and organizational environment than in one's own person.

Theoretical implications

Our results agree with recent research on how positive personal and environmental factors increase engagement which, in turn, increases specific positive behaviors, such as performance (Salanova et al., 2005a) or organizational commitment (Schaufeli & Bakker, 2004). Moreover, the finding that students' perception of

obstacles and facilitators affects their academic performance via increasing levels of study engagement one semester later agrees, in part, with the JD-R model (Bakker & Demerouti, 2007; Schaufeli & Bakker, 2004). Specifically, the current study confirms the assumption of the JD-R model that engagement mediates the relationship between job demands and performance (motivational process), whereas it does not confirm the mediating role of burnout in the relationship between job demands and performance. Moreover, exhaustion, but not cynicism, relate negatively and significantly with performance (see Table 3). Our model extends previous research in which the relationships between job demands and engagement were inconclusive (Llorens et al., 2006; Schaufeli & Bakker, 2004). Nevertheless, job resources have a particular impact on engagement when demands are high (see Bakker, Hakanen, Demerouti, & Xanthopoulou, 2007). In our study, we observed that the more obstacles perceived, the less engaged students feel. So perhaps, including obstacles in future studies instead of demands would result in a less ambiguous negative relationship with engagement.

On a more general level, our results agree with Hackman and Oldham's (1980) Job Characteristics Theory (JCT), which assumes that the so-called critical psychological states (i.e., meaningfulness, responsibility, and knowledge of the results) mediate between job characteristics (i.e., organizational facilitators or resources, such as variety, task identity, task significance, autonomy, and feedback) and outcomes (e.g., job performance). In our study, engagement, but not burnout, seems to play an analogous role in a critical psychological state. However, our findings expand the JCT because, according to this theory, critical psychological states are primarily cognitive in nature, whereas our engagement construct primarily reflects a motivational state. Hence, it appears that obstacles and facilitators affect students' motivation which, in turn, induces good performance.

The fact that a positive state, such as engagement, increases performance in students also agrees with the so-called Broaden-and-Build theory of positive emotions (Fredrickson, 2001). This theory posits that the experience of positive emotions broadens thought-action repertoires and builds enduring personal resources. Although, Fredrickson's theory is about emotions, such as joy, interest, and contentment, one may speculate that study engagement, which includes enthusiasm, pride, inspiration, and challenge, may have a similar effect on broadening habitual modes of thinking and acting, and thus increases the likelihood of displaying better future performance.

Practical implications

Our findings showed that engagement relates directly to performance, which offers the possibility of enhancing engagement and boosting performance through increasing facilitators or decreasing obstacles. However, it is important to note that previous performance accounts for most of the variance of future performance, which confirms the layman's belief that success breeds success. Nevertheless, obstacles and facilitators via engagement are also likely to influence past performance. Hence, not only increasing facilitators and decreasing obstacles but also enhancing engagement directly, may promote performance.

In Spanish and Belgian students, Salanova et al. (2005b) showed that enhancing student's efficacy beliefs may increase engagement. Their study revealed a gain spiral

in which past academic success reinforced efficacy beliefs and engagement, resulting in more positive future efficacy beliefs. In this way, efficacy beliefs may boost students' engagement levels and, eventually, their performance.

Although, we saw no effect of burnout on future performance in this study, relationships with obstacles and facilitators apparently exist in the sense that study burnout relates to the presence of more obstacles and of less facilitators, which may decrease by removing obstacles and augmenting facilitators. By doing so, not only do we expect burnout to decrease (which is a valuable outcome for students in itself), but may also increase performance indirectly via student engagement.

Limitations and future research

We are aware that the common method variance may partly influence our results because we used self-report questionnaires to measure the obstacles, facilitators, burnout, and engagement. However, we also used an objective measure of academic performance, GPA, so that the common method variance problem is less serious for this focal outcome variable. Furthermore, we employed an independent qualitative study as the basis to make the list of obstacles and facilitators, and this may have also lowered the method variance.

Although our study was of a prospective design, in which the current perceptions of academic obstacles and facilitators and student well-being (i.e., burnout and engagement), and also previous objective performance predicted future academic performance, a future longitudinal research could investigate the dynamic reciprocal nature of all the study variables. For instance, academic performance may also lower the perception of obstacles or increase facilitators in the sense of accumulating resources over time, as described by the Conservation of Resources Theory (the COR Theory by Hobfoll & Shirom, 2001).

Final note

Despite the limitations, on one hand the results of our study make a strong case for the existence of a motivational process that links positive perceptions of personal and environmental factors (facilitators) via engagement to future performance, as objectively assessed by students' GPA. On the other hand, a health impairment process also seems to exist, that is, the presence of obstacles and the absence of facilitators which relate to study burnout. However, this process is not involved in predicting performance, thus illustrating the independence of both processes.

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